Space Weather Forecast

Issued on Tuesday, 26 April 2022 at 13:09 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate-class flares (R1/R2 Radio Blackouts) likely, with a slight chance of Strong flares (R3 Radio Blackouts).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low, with just Common-class flares in the last 24 hours. The two largest and most complex regions on the disc are close together in the northwest quadrant. Both have been showing signs of simplification through this period. The remaining numbered regions are currently relatively simple with no significant activity. Two further regions are rotating onto the southeast limb - these are not yet fully visible so are difficult to classify at the present time, however some Coronal Mass Ejection (CME) activity has been seen from over the limb before they rotated onto the disc. No Earth-directed CMEs have been observed in available imagery, however.

Solar Wind / Geomagnetic Activity: The solar wind has been indicative of a gradual waning of the fast wind from a coronal hole. Wind speeds have declined from just below 450 km/s, to near 380 km/s. Overall magnetic field strength has been weak, with the north-south component also varying weakly. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be Low, with the possibility of some Moderate activity, and a slight chance of High activity. This is mainly due to two significant regions in the northwest quadrant, although these have simplified slightly recently. Further active regions are currently rotating onto the southeast limb, but these are not yet fully visible.

Solar Wind / Geomagnetic Activity: No Earth directed CMEs are currently expected during this period. The recent coronal hole fast wind has continued to wane, with wind speeds now back to slow levels. There is a further coronal hole fast wind which is forecast to connect with Earth during Day 3 (28 April) or perhaps early on Day 4 (29 April). Wind speeds from the previous rotation reached just above 550 km/s.
Geomagnetic activity is expected to be mainly Quiet through Days 1 and 2, becoming Unsettled to Active later on Day 3 as the fast wind arrives, with a slight chance of a G1/Minor Storm interval in association with this feature.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels with no solar radiation storms occurring. However, there is a slight chance of solar radiation storms, as the complex sunspot regions in the northwest of the visible disc are now in a position where any energetic particles that may be released during larger flares could reach Earth.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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